

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-103331

(43)Date of publication of application : 21.04.1998

(51)Int.Cl.

F16B 37/10

F16M 11/24

(21)Application number : 08-260626

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(22)Date of filing : 01.10.1996

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(54) ONE TOUCH ADJUSTER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide provide a one touch adjuster to facilitate regulation of a position to a screw shaft as durability is improve through reduction of a load on a screw part.

SOLUTION: A one touch adjuster comprises a pair of screw blocks 15 arranged on both sides of a screw shaft 5 with the screw shaft 5 nipped therebetween in a manner to approach and separate from each other, and forming respective female screw part joined in a screwed-in state with the screw shaft 5; a first energizing means 32 to respectively energize a pair of the screw blocks 15 to the screw shaft 5 side; an inclination press surface 46 slidable throughout a range between a lock position and an unlock position and separating the two screw blocks 15 from the screw shaft 5 through press operation to the unlock position side; an operation member 16 having regulation members 41 and 42 engaged with the two screw blocks 15 in a lock position and regulating movement of the two screw blocks 15 in a separating direction and separated away from the screw block 15 before the two block shafts 15 are separated through press operation to the unlock position side; and a second energizing means 33 to energize the operation member 16 to the lock position side.



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CLAIMS

[Claim(s)]

[Claim 1]A one-touch type adjuster comprising:

inserting a screw axis -- the both sides -- mutual -- approach -- one pair of screw pieces by which it was provided so that alienation was possible, and an internal thread part screwed in a screw axis was formed in the end face by the side of a screw axis, respectively.

The 1st energizing means that energizes said one pair of screw pieces to the screw-axis side,

respectively.

An inclined pressing face which can cover a locked position and an unlocked position, can slide freely, resists energizing force of the 1st energizing means and makes both screw piece estrange from a screw axis in contact with both screw piece by pushing operation by the side of an unlocked position.

engaging with both screw piece in a locked position -- alienation of both screw piece -- the 2nd energizing means that energizes an operating member which has a restricting part which secedes from a screw piece before moving in the direction which regulates movement in a direction and both screw piece estranges by pushing operation by the side of an unlocked position, and said operating member to the locked position side.

[Claim 2]making two restricting parts which engage with both sides of an internal thread part of a screw piece, respectively correspond to one pair of screw pieces, forming them in an operating member, respectively, and setting them to a locked position -- alienation of a screw piece -- the one-touch type adjuster according to claim 1 which regulated movement in a direction by two restricting parts, respectively.

[Claim 3]The one-touch type adjuster according to claim 1 or 2 which formed an approximately annular female screw child who screws in a screw axis by an internal thread part where two screw pieces are compared.

[Claim 4]A one-touch type adjuster of claim 1-3 which provided a sleeve which accommodates one pair of screw pieces, the 1st energizing means, an operating member, and the 2nd energizing means in a casing, and shows the upper part and the lower part of this casing to a screw axis only in a sliding direction given in any 1 paragraph.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates the screwing position over a screw axis to the one-touch type adjuster which can be switched by one-touch.

[0002]

[Description of the Prior Art]Generally, as a height adjusting device for performing height adjustment, such as furniture and electrical household appliances and electrical equipment, provide a nut member in the lower parts, such as furniture and electrical household appliances and electrical equipment, in the shape of burial, the screw axis which has a leveling pad in a lower end is made to screw in this nut member, and what was constituted so that height adjustment might be carried out by carrying out rotatably operating of the screw axis is adopted widely. However, in this kind of

height adjusting device, when the amount of adjustments increases, there is a problem that the work of that part height adjustment becomes complicated on the relation which carries out rotatably operating of the screw axis, and carries out height adjustment.

[0003] So, to JP,6-213225,A. While providing the body member which bent the tabular member in the shape of an abbreviated U character and forming an internal thread part in the inner surface of the bending portion of a body member, The screw piece which can be freely slid to the bending portion side is provided among the both ends of a body member, an internal thread part is formed in the end face by the side of the bending portion of a screw piece, and the simple fastening device which provided the control lever for carrying out sliding operation of the screw piece to the bending portion side is indicated. In this simple fastening device, where a screw piece is retreated by a control lever, By moving the screw axis made to insert in inside the bending portion of a body member to shaft orientations, moving a simple fastening device to the desired position of a screw axis, operating a control lever in this state and moving a screw piece to the bending portion side. It is constituted so that a screw axis may be pinched by two internal thread parts and a simple fastening device can be fixed to the desired position of a screw axis. Where it divided into two the nut member screwed to a screw axis by the parting plane in alignment with the axial center of the screw axis and these two split nut members are combined with JP,5-83434,U on both sides of a screw axis, The double nut which is fixable to the desired position of a screw axis by making the cover member which regulates movement to the diameter direction to a biparite rate nut member attach outside is indicated.

[0004]

[Problem(s) to be Solved by the Invention] In using this for said gazette as the legs, such as furniture and electrical household appliances and electrical equipment, in the simple fastening device of a statement, for example, While fixing a body member to frames, such as furniture and electrical household appliances and electrical equipment, and establishing a leveling pad in the lower end of a screw axis, in order to prevent with Grad of the leg, a screw axis will be attached only to a sliding direction to a frame, enabling free movement, but. If it attaches in this way, since it becomes impossible radially to a screw axis moving a body member, even if a screw piece is retreated and it cancels engagement relation with a screw axis, the fault referred to as that the engagement relation of the internal thread part by the side of a body member and a screw axis is not canceled will occur. In order to solve this, omitting the internal thread part by the side of a body member is also considered, but since furniture, electrical household appliances and electrical equipment, etc. will be supported only by the internal thread part by the side of a screw piece when constituted in this way, an engagement face product with a screw axis decreases, and the problem of wearing a screw portion out or becoming easy to be damaged occurs. A screw piece is made to weld by pressure to a screw axis, in the state where the screw piece was made to engage with a screw axis, the rotatably operating of a screw axis becomes heavy and there is a problem that the operativity of fine adjustment of the height which rotates [make] a screw axis falls substantially on the relation which maintains the engagement relation of an internal thread part and a screw axis.

[0005] The purpose of this invention is to provide a one-touch type adjuster with easy positioning to a screw axis, making load to a screw portion small and improving endurance.

[0006]

[Means for Solving the Problem] A one-touch type adjuster concerning claim 1, inserting a screw axis -- the both sides -- mutual -- approach -- it being provided so that alienation is possible, and with one pair of screw pieces by which an internal thread part screwed in a screw axis was formed in the end face by the side of a screw axis, respectively. The 1st energizing means energized, respectively, and a locked position and an unlocked position can be covered, and one pair of screw pieces can be freely slid to the screw-axis side, An inclined pressing face which resists energizing force of the 1st energizing means and makes both screw piece estrange from a screw axis in contact with both screw piece by pushing operation by the side of an unlocked position, engaging

with both screw piece in a locked position -- alienation of both screw piece -- movement in a direction being regulated and with an operating member which has a restricting part which secedes from a screw piece before moving in the direction which both screw piece estranges by pushing operation by the side of an unlocked position. It has the 2nd energizing means that energizes an operating member to the locked position side.

[0007]In [make the two restricting parts according to claim 2 which engage with both sides of an internal thread part of a screw piece like, respectively correspond to one pair of screw pieces, form them in an operating member here, respectively, and] a locked position, alienation of a screw piece -- movement in a direction, where [according to claim 3] two screw pieces are compared like, regulating by two restricting parts, respectively, and, Like forming an approximately annular female screw child who screws in a screw axis by an internal thread part, and a statement to claim 4, It is a desirable example to provide a sleeve which accommodates one pair of screw pieces, the 1st energizing means, an operating member, and the 2nd energizing means in a casing, and shows a screw axis only to a sliding direction at the upper part and the lower part of this casing etc.

[0008]

[Function]In the one-touch type adjuster concerning claim 1, inserting a screw axis -- the both sides -- mutual -- approach, if one pair of screw pieces are provided so that alienation is possible, and pushing operation of the operating member is carried out to an unlocked position, A restricting part will secede from a screw piece first, it will move in the direction which an inclined pressing face is welded next by pressure to a screw piece, and a screw piece estranges mutually, and the engagement relation of a screw piece and a screw axis will be canceled. And in this state, a screw axis will be in the state which can move to shaft orientations freely relatively to a screw piece and an operating member, will move a screw axis to a desired position, and will perform height adjustment etc. In this way, while it will move in the direction in which a screw piece approaches mutually by the 1st energizing means and an internal thread part will engage with a screw axis if fingers are released off an operating member after moving a screw axis to a desired position, After an operating member moves to the locked position side by the 2nd energizing means and a screw piece engages with a screw axis by the energizing force of the 1st energizing means, a restricting part will engage with a screw piece and the engagement state of two screw pieces and screw axes will be maintained.

[0009]Thus, since engagement secession of the screw piece is carried out to a screw axis by carrying out approach alienation of the two screw pieces, even if it forms a screw axis only in shaft orientations, enabling free movement, it becomes possible to ensure engagement secession of the screw piece to a screw axis. Since two screw pieces are made to engage with a screw axis, both engagement face product can be set up greatly easily, and it becomes possible to make load to a screw portion small. furthermore -- in a locked position -- a restricting part -- alienation of both the screw piece -- since movement in a direction is regulated, it is not necessary to make a screw piece weld by pressure firmly to a screw axis That is, also in the state where the screw piece was made to engage with a screw axis, it becomes possible to carry out rotatably operating of the screw axis comparatively easily, and the operativity of fine adjustment of the height by the rotatably operating of a screw axis, etc. improves. and a restricting part -- alienation of a screw piece -- since movement in a direction is regulated, even if big power acts on shaft orientations to a screw axis, it becomes possible to maintain the engagement relation of a screw axis and a screw piece certainly.

[0010]Here, it becomes possible to respond to the load according to claim 2 which will act to a screw piece by two restricting parts if constituted like with sufficient balance, and it becomes possible to stabilize the engagement relation of a screw axis and a screw piece further. The load [as opposed to / if constituted like, will enlarge the engagement face product of a screw axis and a screw piece as much as possible, and / a screw portion] according to claim 3 can be made still smaller. It becomes possible by the thing [attaching a casing to the lower parts, such as furniture

and electrical household appliances and electrical equipment, if constituted like] according to claim 4 to use a one-touch type adjuster as the legs, such as furniture and electrical household appliances and electrical equipment, as it is.

[0011]

[Embodiment of the Invention] Hereafter, it explains, referring to drawings for the example of this invention. This example is a thing at the time of applying this invention to the height adjusting device attached to the frame lower parts, such as furniture and electrical household appliances and electrical equipment. As shown in drawing 1 - drawing 4, the height adjusting device 1 is provided with the main part 3 of an adjusting device which consists of a one-touch type adjuster attached to the lower part of the frames 2, such as furniture and electrical household appliances and electrical equipment, and the leg 4 which inserted the main part 3 of an adjusting device in the sliding direction, and was provided. It is adjusting individually the length of the leg 4 which two or more places of this height adjusting device 1 are established in the lower part of the frame 3, and is made to project from the main part 3 of an adjusting device to a lower part. On the whole, height adjustment of furniture, the electrical household appliances and electrical equipment, etc. will be carried out, or only the height on front or the backside will be adjusted in a projector etc.

[0012] The leg 4 has the disc-like leveling pad 6 attached to the lower end of the screw axis 5 and the screw axis 5.

Two or more projections 7 for skids are formed in the peripheral part of this leveling pad 6, and it is constituted so that rotatably operating of the screw axis 5 may be carried out and height can be finely tuned with the leveling pad 6.

The stopper plate 8 for keeping the screw axis 5 from falling out from the main part 3 of an adjusting device is being fixed to the upper bed part of the screw axis 5. Where the elastic member 9 which consists of a wave spring, a plate spring, a synthetic rubber, etc. is attached to the stopper plate 8 bottom and the screw axis 5 is moved to a lower limit position, It comprises that the screw axis 5 carries out fine movement caudad by the elastic member 9 so that the internal thread part 28 of the below-mentioned screw piece 15 may screw in the screw axis 5 smoothly.

[0013] When the main part 3 of an adjusting device is explained, as shown in drawing 1 - drawing 4, it is provided by the casing 12 which consists of the casing-upper half 10 and the casing lower half 11, and in the casing 12, In an order from the upper part, the upper sleeves 13, the upper plate 14, the screw piece 15 of one pair of right and left, the operating member 16, the lower sleeve 17, and the lower plate 18 are formed in order. The numerals 19 are the claw parts for carrying out the temporary stop of both the casings 10 and 11.

[0014] The upper sleeves 13 have the plate-like plate part 20 and the cylinder part 21 formed in the center section of the plate part 20 at protrusion state.

It is made to fit into the mounting hole 22 which formed the cylinder part 21 in the upper wall part of the casing-upper half 10, and is arranged at the upper wall part bottom.

The lower sleeve 17 has the cylinder part 24 which fits into the mounting hole 23 formed in the low wall part and the lower plate 18 of the casing lower half 11, and the flange 25 formed in the upper bed part of the cylinder part 24.

The flange 25 is made to engage with the upper surface of the lower plate 18, and the slip off stop is carried out.

And the screw axis 5 inserts in the cylinder parts 21 and 24 of the up-and-down sleeves 13 and 17, and is guided, enabling free movement only to a sliding direction.

[0015] The breakthrough 26 which the screw axis 5 inserts in is formed in the approximately center part of the upper plate 14. However, the up-and-down plates 14 and 18 are for responding to the load to the diameter direction of the screw axis 5 while moving the screw piece 15 and the operating member 16 smoothly.

To make these functions make it serve a double purpose by the casing 12 or the sleeves 13 and 17, it is not necessarily required.

[0016]As shown in drawing 4 – drawing 10, the screw piece 15 on either side consists of a member of symmetrical plane view abbreviation L character-like block like shape, and is attached in the casing lower half 11 via the internal surface of the casing lower half 11, enabling the free slide only to a longitudinal direction. The internal thread part 28 screwed in the screw axis 5 is formed in the opposed face of both the screw piece 15, respectively, and both the internal thread parts 28 are constituted so that it may become an approximately annular perfect female screw child whom the screw axis 5 screws where the screw piece 15 is compared. Drawing 6 – drawing 10 are the figures showing the left-hand side screw piece 15.

[0017]In the casing lower half 11, between the screw piece 15 on either side, the lower sleeve 17, and the lower plate 18, The locked position shown in drawing 16 and the unlocked position shown in drawing 18 are covered, the operating member 16 which can move to a cross direction freely is formed, and as shown in drawing 11 – drawing 15, the long hole 29 prolonged in the cross direction which the screw axis 5 inserts in is formed in the approximately center part of the operating member 16. Along with the long hole 29, the wall side 30 is formed in the undersurface of the operating member 16 in the shape of an ellipse, the flange 25 of the lower sleeve 17 is accommodated inside this wall side 30, and position regulating of the operating member 16 is carried out to the unlocked position and the locked position because the wall side 30 contacts the flange 25. The final controlling element 31 projected from the casing 12 to the front is formed in the anterior part of the operating member 16, and it is constituted so that the pushing operation of the operating member 16 can be carried out to the unlocked position side via this final controlling element 31.

[0018]The screw piece 15 on either side is energized by the 1st energizing means 32 that consists of compression springs to the screw-axis 5 side, respectively, and the operating member 16 is always energized by the 2nd energizing means 33 that consists of compression springs to the locked position side. However, a flat spring may be used as the energizing means 32 and 33, the elastic section which can give energizing force may be formed in the screw piece 15, the casing 12, or the operating member 16 according to the elastic force of a raw material, and this may be utilized as the energizing means 32 and 33. The numerals 34 are the spring retention groove holding the end of the 1st energizing means 32.

The numerals 35 are spring attaching parts inserted in the front end part of the 2nd energizing means 33.

[0019]Next, it regulates that the screw piece 15 on either side estranges mutually in a locked position, and the mechanism for making the screw piece 15 on either side estrange mutually is explained by the pushing operation of the operating member 16 by the side of an unlocked position, referring to drawing 2 – drawing 19. The rear of the operating member 16 is formed in the inclined form which approaches mutually as it goes to the back side, and the inclination projected part 40 prolonged upwards in accordance with a side attachment wall on either side is formed in the upper surface rear of the operating member 16. The 1st restricting part 41 bent in the direction which approaches mutually is formed in the front end part of the inclination projected part 40 on either side, and the 2nd restricting part 42 is formed in the rear end part of the inclination projected part 40 on either side upwards at protrusion state. The inclined groove 43 is formed in the undersurface of the corner of the screw piece 15 on either side, the engagement groove 44 which extends in the sliding direction which is open for free passage to the rear end opening of the inclined groove 43 is formed in the rear face of the screw piece 15 in the back of the internal thread part 28, and the opening of the front end part of the inclined groove 43 is carried out towards the front.

[0020]The screw piece 15 on either side is attached on the operating member 16 in the state where the inclined groove 43 was made to fit into the inclination projected part 40 of the right and left of the operating member 16, respectively, and the operating member 16 in the state where it is located

in a locked position. As shown in drawing 16, while the inclination projected part 40 is arranged at the approximately center part of the cross direction of the inclined groove 43 and the 1st restricting part 41 contacts the engagement face 45 of the side of the anterior part of the screw piece 15, The 2nd restricting part 42 fits into the engagement groove 44 of the screw piece 15, movement in the direction estranged to both the screw pieces 15 on either side is regulated, and the internal thread part 28 on either side is maintained by the state where it was compared.

[0021]On the other hand, until the inclined pressing face 46 of the inclination projected part 40 will contact the inclination abutment 47 of the inclined groove 43 which meets it as shown in drawing 17 if the operating member 16 is operated to the back, i.e., unlocked position, side, The state where the screw piece 15 on either side does not move in the direction estranged mutually is maintained, and while the 1st restricting part 41 enters in the inclined groove 43 and secedes from the engagement face 45, the 2nd restricting part 42 secedes from the engagement groove 44. And if the inclined pressing face 46 contacts the inclination abutment 47 and carries out pushing operation of the operating member 16 to back further in this state after engagement to the restricting parts 41 and 42 and the screw piece 15 is canceled, as shown in drawing 18 and drawing 19, The inclination abutment 47 will be pressed in the inclined pressing face 46, the energizing force of the 1st energizing means 32 will be resisted, and the screw piece 15 on either side will estrange mutually.

[0022]If fingers are released off the operating member 16, while moving in the direction in which the screw piece 15 on either side approaches mutually by the 1st energizing means 32, After the operating member 16 moved to the locked position side by the 2nd energizing means 33 and the internal thread part 28 of the screw piece 15 on either side has screwed in the screw axis 5, While the 1st restricting part 41 contacts the engagement face 45, the 2nd restricting part 42 will engage with the engagement groove 44, movement in the direction estranged to both the screw pieces 15 on either side will be regulated, and the screw axis 5 will be held by the screw piece 15 on either side.

[0023]Next, an operation of the height adjusting device 1 and an effect are explained. In replacing the height of furniture, electrical household appliances and electrical equipment, etc. with, where furniture, electrical household appliances and electrical equipment, etc. are supported, carry out pushing operation of the operating member 16, make the screw piece 15 on either side estrange mutually, the internal thread part 28 is made to secede from the screw axis 5, and it adjusts the wire extension of the screw axis 5 to the desired length. And since the screw axis 5 is moved to a desired position, while releasing fingers off the operating member 16 and making the internal thread part 28 of the screw piece 15 on either side engage with the screw axis 5, it will be made to engage with each of the screw piece 15 of right and left [the restricting parts 41 and 42], and movement to the shaft orientations of the screw axis 5 will be regulated. When tuning height finely, the wire extension of the screw axis 5 will be adjusted maintaining the state where rotated the leveling pad 6 and the screw axis 5 was made to screw in the screw piece 15 on either side, and the height of furniture, electrical household appliances and electrical equipment, etc. will be tuned finely.

[0024]Thus, the pushing operation of the operating member 16 cancels the screwing relation between the screw piece 15 on either side and the screw axis 5 by one-touch, the screw axis 5 is changed into a movable state to shaft orientations, and it becomes possible to change the attaching position of the main part 3 of an adjusting device to the screw axis 5. By releasing fingers off the operating member 16, the screw piece 15 on either side engages with the screw axis 5, and movement of the screw axis 5 is regulated, and alienation of the screw piece 15 on either side -- it will respond to movement in a direction with sufficient balance by the two restricting parts 41 and 42 which engage with the internal thread part 28 order both sides, and the engagement relation of the screw piece 15 on either side and the screw axis 5 will be maintained certainly.

[0025]The one-touch type adjuster concerning this invention can be applied also to apparatus other than height adjusting device 1.

[0026]

[Effect of the Invention] According to the one-touch type adjuster concerning claim 1, it becomes possible to ensure engagement secession of the screw piece to a screw axis. The engagement face product of a screw piece and a screw axis can be set up greatly easily, load to a screw portion is made small, and the endurance of a screw portion can be improved. The rotary operability of a screw axis in the state where the screw piece was made to engage with a screw axis is improved, and it becomes possible to tune easily the engagement position of the screw piece to a screw axis finely. furthermore -- again -- a restricting part -- alienation of a screw piece -- since movement in a direction is regulated, even if big power acts on shaft orientations to a screw axis, it becomes possible to maintain the engagement relation of a screw axis and a screw piece certainly.

[0027] It becomes possible to respond to the load according to claim 2 which will act to a screw piece if constituted like with sufficient balance by two restricting parts, the engagement relation of a screw axis and a screw piece is stabilized, and the fault that the engagement relation of a screw axis and a screw piece is canceled carelessly can be prevented. The load [as opposed to / if constituted like, will enlarge the engagement face product of a screw axis and a screw piece as much as possible, and / a screw portion] according to claim 3 can be made still smaller, and the endurance of a screw portion can be improved. The thing [attaching a casing to the lower parts, such as furniture and electrical household appliances and electrical equipment, and using a one-touch type adjuster as the legs, such as furniture and electrical household appliances and electrical equipment, as it is, if constituted like] according to claim 4 becomes possible.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The side view of a height adjusting device

[Drawing 2] The II-II line sectional view of drawing 1

[Drawing 3] The III-III line sectional view of drawing 2

[Drawing 4] The division perspective view of the main part of an adjusting device

[Drawing 5] A screw piece on either side and the perspective view of an operating member

[Drawing 6] The top view of a left-hand side screw piece

[Drawing 7] The left side view of the screw piece

[Drawing 8] The right side view of the screw piece

[Drawing 9] The rear elevation of the screw piece

[Drawing 10] The bottom view of the screw piece

[Drawing 11] The top view of an operating member

[Drawing 12] The XII-XII line sectional view of drawing 11

[Drawing 13] The bottom view of an operating member

[Drawing 14] The rear elevation of an operating member

[Drawing 15]The front view of an operating member

[Drawing 16]A screw piece and the operation explanatory view of an operating member

[Drawing 17]A screw piece and the operation explanatory view of an operating member

[Drawing 18]A screw piece and the operation explanatory view of an operating member

[Drawing 19]The drawing 2 equivalent figure in the state where engagement to a screw axis was canceled

[Description of Notations]

1 Height adjusting device Two Frame
3 Main part of an adjusting device Four Leg
5 Screw axis Six Leveling pad
7 Projection Eight Stopper plate
9 Elastic member
10 Casing-upper half 11 casings lower half
12 Casing 13 upper sleeves
14 Upper plate 15 Screw piece
16 Operating member 17 lower sleeves
18 Lower plate 19 Claw part
20 Plate part 21 Cylinder part
22 Mounting hole 23 Mounting hole
24 Cylinder part 25 Flange
26 Breakthrough
28 Internal thread part 29 Long hole
30 Wall side 31 Final controlling element
32 The 1st energizing means 33 The 2nd energizing means
34 Spring retention groove 35 Spring attaching part
40 Inclination projected part 41 The 1st restricting part
42 The 2nd restricting part 43 Inclined groove
44 Engagement groove 45 Engagement face
46 Inclined pressing face 47 Inclination abutment

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DRAWINGS

[Drawing 1]

(51)Int.Cl.⁵

F 1 6 B 37/10

F 1 6 M 11/24

識別記号

F I

F 1 6 B 37/10

F 1 6 M 11/24

C

審査請求 未請求 請求項の数4 O L (全 8 頁)

(21)出願番号 特願平8-260626

(22)出願日 平成8年(1996)10月1日

(71)出願人 390007951

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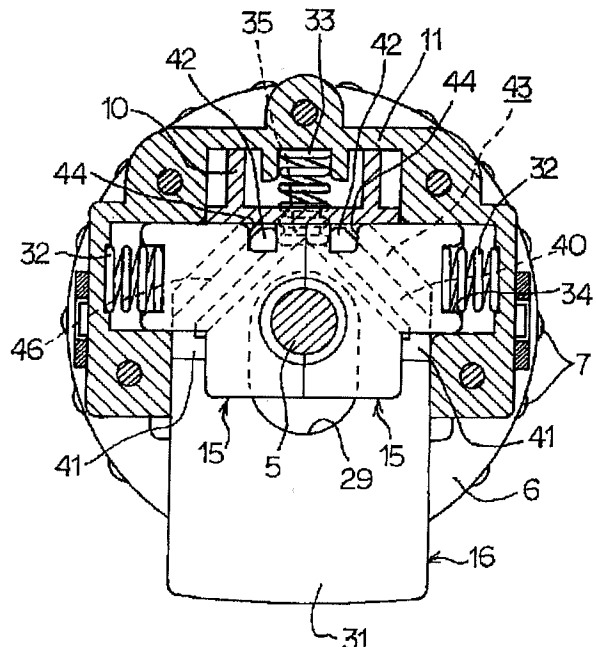
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(54)【発明の名称】 ワンタッチ式アジャスター

(57)【要約】

【課題】 螺子部分に対する負荷を小さくして耐久性を向上しつつ、螺軸に対する位置調整が容易なワンタッチ式アジャスターを提供する。

【解決手段】 螺軸5を挟んでその両側に相互に接近離間可能に設けられ、螺軸5に螺合する雌螺子部28が夫々形成された1対の螺子駒15と、1対の螺子駒15を螺軸5側へ夫々付勢する第1付勢手段32と、ロック位置とアンロック位置とに互ってスライド自在で、アンロック位置側への押し操作により、両螺子駒15を螺軸5から離間させる傾斜押圧面46と、ロック位置において両螺子駒15に係合して両螺子駒15の離間方向への移動を規制し、アンロック位置側への押し操作で両螺子駒15が離間する方向へ移動する前に螺子駒15から離脱する規制部41、42とを有する操作部材16と、操作部材16をロック位置側へ付勢する第2付勢手段33とを備えた。



【特許請求の範囲】

【請求項1】 螺軸を挟んでその両側に相互に接近離間可能に設けられ、螺軸側の端面に螺軸に螺合する雌螺子部が夫々形成された1対の螺子駒と、

前記1対の螺子駒を螺軸側へ夫々付勢する第1付勢手段と、

ロック位置とアンロック位置とに互ってスライド自在で、アンロック位置側への押し操作により、両螺子駒に当接して両螺子駒を第1付勢手段の付勢力に抗して螺軸から離間させる傾斜押圧面と、ロック位置において両螺子駒に係合して両螺子駒の離間方向への移動を規制し、アンロック位置側への押し操作で両螺子駒が離間する方向へ移動する前に螺子駒から離脱する規制部とを有する操作部材と、

前記操作部材をロック位置側へ付勢する第2付勢手段と、

を備えたワンタッチ式アジャスター。

【請求項2】 螺子駒の雌螺子部の両側に夫々係合する2つの規制部を、1対の螺子駒に対応させて操作部材に夫々形成し、ロック位置において、螺子駒の離間方向への移動を2つの規制部で夫々規制した請求項1記載のワンタッチ式アジャスター。

【請求項3】 2つの螺子駒を突き合わせた状態で、雌螺子部により螺軸に螺合する略環状の雌螺子を形成した請求項1又は2記載のワンタッチ式アジャスター。

【請求項4】 1対の螺子駒と第1付勢手段と操作部材と第2付勢手段とをケーシング内に收容し、このケーシングの上部と下部とに螺軸を上下方向にのみ案内するスリーブを設けた請求項1～3のいずれか1項記載のワンタッチ式アジャスター。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、螺軸に対する螺合位置をワンタッチで切換え可能なワンタッチ式アジャスターに関する。

【0002】

【従来の技術】一般に、家具や家電機器等の高さ調整を行うための高さ調整装置として、家具や家電機器等の下部にナット部材を埋設状に設けて、下端に脚座を有する螺軸をこのナット部材に螺合させ、螺軸を回転操作することで高さ調整するように構成したものが広く採用されている。ところが、この種の高さ調整装置では、螺軸を回転操作して高さ調整する関係上、調整量が増えるとその分高さ調整の作業が煩雑になるという問題がある。

【0003】そこで、特開平6-213225号公報には、板状の部材を略U字状に折曲した本体部材を設け、本体部材の折曲部分の内面に雌螺子部を形成するとともに、本体部材の両端部間に折曲部分側へスライド自在な螺子駒を設け、螺子駒の折曲部分側の端面に雌螺子部を形成し、螺子駒を折曲部分側へスライド操作するための

操作レバーを設けた簡易締結装置が記載されています。この簡易締結装置では、操作レバーにより螺子駒を後退させた状態で、本体部材の折曲部分の内側に挿通させた螺軸を軸方向に移動させて、簡易締結装置を螺軸の所望位置へ移動させ、この状態で操作レバーを操作して螺子駒を折曲部分側へ移動させることで、2つの雌螺子部で螺軸を挟持して簡易締結装置を螺軸の所望位置に固定し得るように構成されている。また、実開平5-83434号公報には、螺軸に対して螺合するナット部材を螺軸の軸心に沿った分割面で2つに分割し、これら2つの分割ナット部材を螺軸を挟んで組み合わせさせた状態で、両分割ナット部材に対してその径方向への移動を規制する外被部材を外嵌させることで、螺軸の所望位置に固定可能な二重ナットが記載されています。

【0004】

【発明が解決しようとする課題】前記公報に記載の簡易締結装置では、例えばこれを家具や家電機器等の脚部として用いる場合には、本体部材を家具や家電機器等のフレームに固定し、螺軸の下端に脚座を設けるとともに、脚部のグラ付きを防止するため、螺軸をフレームに対して上下方向にのみ移動自在に取付けることになるが、このように組付けると、本体部材が螺軸に対して半径方向に移動不能となることから、螺子駒を後退させて螺軸との係合関係を解除しても、本体部材側の雌螺子部と螺軸との係合関係が解除されないという不具合が発生する。これを解決するために、本体部材側の雌螺子部を省略することも考えられるが、このように構成すると、螺子駒側の雌螺子部のみで家具や家電機器等を支持することになるので、螺軸との係合面積が少なくなり螺子部分が摩耗したり損傷し易くなるという問題が発生する。また、螺子駒を螺軸に圧接させて、雌螺子部と螺軸との係合関係を維持する関係上、螺子駒を螺軸に係合させた状態では、螺軸の回転操作が重くなり、螺軸を回転させての高さの微調整の操作性が大幅に低下するという問題がある。

【0005】本発明の目的は、螺子部分に対する負荷を小さくして耐久性を向上しつつ、螺軸に対する位置調整が容易なワンタッチ式アジャスターを提供することである。

【0006】

【課題を解決するための手段】請求項1に係るワンタッチ式アジャスターは、螺軸を挟んでその両側に相互に接近離間可能に設けられ、螺軸側の端面に螺軸に螺合する雌螺子部が夫々形成された1対の螺子駒と、1対の螺子駒を螺軸側へ夫々付勢する第1付勢手段と、ロック位置とアンロック位置とに互ってスライド自在で、アンロック位置側への押し操作により、両螺子駒に当接して両螺子駒を第1付勢手段の付勢力に抗して螺軸から離間させる傾斜押圧面と、ロック位置において両螺子駒に係合して両螺子駒の離間方向への移動を規制し、アンロック位

置側への押し操作で両螺子駒が離間する方向へ移動する前に螺子駒から離脱する規制部とを有する操作部材と、操作部材をロック位置側へ付勢する第2付勢手段とを備えたものである。

【0007】ここで、請求項2記載のように、螺子駒の雌螺子部の両側に夫々係合する2つの規制部を、1対の螺子駒に対応させて操作部材に夫々形成し、ロック位置において、螺子駒の離間方向への移動を2つの規制部で夫々規制すること、請求項3記載のように、2つの螺子駒を突き合わせた状態で、雌螺子部により螺軸に係合する略環状の雌螺子を形成すること、請求項4記載のように、1対の螺子駒と第1付勢手段と操作部材と第2付勢手段とをケーシング内に收容し、このケーシングの上部と下部とに螺軸を上下方向にのみ案内するスリーブを設けること、などが好ましい実施例である。

【0008】

【作用】請求項1に係るワンタッチ式アジャスターにおいては、螺軸を挟んでその両側に相互に接近離間可能な1対の螺子駒が設けられ、操作部材をアンロック位置へ押し操作すると、先ず螺子駒から規制部が離脱し、次に傾斜押圧面が螺子駒に圧接されて螺子駒が相互に離間する方向へ移動し、螺子駒と螺軸との係合関係が解除されることになる。そして、この状態で螺軸は、螺子駒及び操作部材に対して相対的に軸方向へ移動自在な状態となり、所望位置へ螺軸を移動させて高さ調整等を行うことになる。こうして、螺軸を所望位置へ移動させた後、操作部材から手指を放すと、第1付勢手段により螺子駒が相互に接近する方向へ移動して、雌螺子部が螺軸に係合するとともに、第2付勢手段により操作部材がロック位置側へ移動して、第1付勢手段の付勢力で螺子駒が螺軸に係合した後、規制部が螺子駒に係合して2つの螺子駒と螺軸との係合状態が維持されることになる。

【0009】このように、2つの螺子駒を接近離間させることで、螺軸に対して螺子駒に係合離脱するので、螺軸を軸方向にのみ移動自在に設けても、螺軸に対する螺子駒の係合離脱を確実に行うことが可能となる。また、2つの螺子駒を螺軸に係合させることから、両者の係合面積を容易に大きく設定でき、螺子部分に対する負荷を小さくすることが可能となる。更に、ロック位置において、規制部で両螺子駒の離間方向への移動が規制されるので、螺子駒を螺軸に対して強固に圧接させる必要はない。つまり、螺子駒を螺軸に係合させた状態においても、比較的容易に螺軸を回転操作することが可能となり、螺軸の回転操作による高さ等の微調整の操作性が向上する。しかも、規制部で螺子駒の離間方向への移動を規制するので、螺軸に対して軸方向に大きな力が作用しても確実に螺軸と螺子駒との係合関係を維持することが可能となる。

【0010】ここで、請求項2記載のように構成すると、2つの規制部により螺子駒に対して作用する荷重を

バランス良く受け止めることが可能となり、螺軸と螺子駒との係合関係を一層安定化させることが可能となる。また、請求項3記載のように構成すると、螺軸と螺子駒との係合面積を極力大きくして、螺子部分に対する負荷を一層小さくできる。更に、請求項4記載のように構成すると、ケーシングを家具や家電機器等の下部に組付けることで、ワンタッチ式アジャスターをそのまま家具や家電機器等の脚部として用いることが可能となる。

【0011】

【発明の実施の形態】以下、本発明の実施例について図面を参照しながら説明する。本実施例は、家具や家電機器等のフレーム下部に組付けられる高さ調整装置に本発明を適用した場合のものである。図1～図4に示すように、高さ調整装置1は、家具や家電機器等のフレーム2の下部に組付けられるワンタッチ式アジャスターからなる調整装置本体3と、調整装置本体3を上下方向に挿通して設けられた脚部4とを備えている。この高さ調整装置1は、フレーム3の下部に複数箇所設けられ、調整装置本体3から下方へ突出させる脚部4の長さを個別に調整することで、家具や家電機器等を全体的に高さ調整したり、プロジェクター等においては、前側或いは後側の高さのみを調整したりすることになる。

【0012】脚部4は、螺軸5と螺軸5の下端に取付けられた円板状の脚座6とを有しており、この脚座6の外周部には滑り止め用の突起7が複数形成され、脚座6とともに螺軸5を回転操作して高さを微調整できるように構成されている。螺軸5の上端部には調整装置本体3から螺軸5が抜け落ちないようにするためのストッパープレート8が固定されている。また、ストッパープレート8の下側にはウェーブスプリングや皿バネや合成ゴムなどからなる弾性部材9が取付けられ、螺軸5を下限位置へ移動させた状態で、弾性部材9により螺軸5が下方に微小移動することで、後述の螺子駒15の雌螺子部28が螺軸5に円滑に係合するように構成されている。

【0013】調整装置本体3について説明すると、図1～図4に示すように、上部ケーシング10と下部ケーシング11とからなるケーシング12が設けられ、ケーシング12内には、上側から順番に、上部スリーブ13、上部プレート14、左右1対の螺子駒15、操作部材16、下部スリーブ17及び下部プレート18が順番に設けられている。尚、符号19は両ケーシング10、11を仮り止めするための爪部である。

【0014】上部スリーブ13は、平板状のプレート部20と、プレート部20の中央部に突出状に形成した筒部21とを有しており、筒部21を上部ケーシング10の上壁部に形成した取付孔22に嵌合させて上壁部の下側に配置されている。下部スリーブ17は、下部ケーシング11の下壁部及び下部プレート18に形成した取付孔23に嵌合する筒部24と、筒部24の上端部に形成した鍔部25とを有しており、鍔部25を下部プレート

18の上面に係合させて抜け止めされている。そして、螺軸5は、上下のスリーブ13、17の筒部21、24を挿通して上下方向にのみ移動自在に案内されている。

【0015】上部プレート14の略中央部には螺軸5が挿通する貫通孔26が形成されている。但し、上下のプレート14、18は、螺子駒15及び操作部材16の移動を円滑になすとともに、螺軸5の径方向への荷重を受け止めるためのものであり、ケーシング12やスリーブ13、17によりこれらの機能を兼用させる場合には必ずしも必要ではない。

【0016】左右の螺子駒15は、図4～図10に示すように、平面視略L字状の左右対称なブロック状の部材からなり、下部ケーシング11の内壁面を介して左右方向にのみスライド自在に下部ケーシング11内に組付けられている。両螺子駒15の対向面には螺軸5に螺合する雌螺子部28が夫々形成され、両雌螺子部28は螺子駒15を突き合わせた状態で螺軸5が螺合する略環状の完全な雌螺子となるように構成されている。尚、図6～図10は左側の螺子駒15を示す図である。

【0017】下部ケーシング11内において左右の螺子駒15と下部スリーブ17及び下部プレート18との間には、図16に示すロック位置と、図18に示すアンロック位置とに互って前後方向に移動自在な操作部材16が設けられ、図11～図15に示すように、操作部材16の略中央部には螺軸5が挿通する前後方向に延びる長孔29が形成されている。操作部材16の下面には長孔29に沿って縦壁面30が長円状に形成され、この縦壁面30の内側に下部スリーブ17の鏝部25が収容され、縦壁面30が鏝部25に当接することで操作部材16がアンロック位置とロック位置とに位置規制されている。操作部材16の前部にはケーシング12から前方へ突出した操作部31が形成され、この操作部31を介して操作部材16をアンロック位置側へ押し操作できるように構成されている。

【0018】左右の螺子駒15は圧縮コイルバネからなる第1付勢手段32により螺軸5側へ夫々付勢され、操作部材16は圧縮コイルバネからなる第2付勢手段33によりロック位置側へ常時付勢されている。但し、付勢手段32、33としては板バネを用いてもよいし、螺子駒15やケーシング12或いは操作部材16に素材の弾性力により付勢力を付与可能な弾性部を形成し、これを付勢手段32、33として活用してもよい。尚、符号34は、第1付勢手段32の一端を保持するバネ保持溝であり、符号35は、第2付勢手段33の前端部に挿通されるバネ保持部である。

【0019】次に、ロック位置において左右の螺子駒15が相互に離間することを規制し、アンロック位置側への操作部材16の押し操作により、左右の螺子駒15を相互に離間させるための機構について、図2～図19を参照しながら説明する。操作部材16の後部は後方側へ

行くにしたがって相互に接近する傾斜状に形成され、操作部材16の上面後部には左右の側壁に沿って上方へ延びる傾斜突部40が形成されている。左右の傾斜突部40の前端部には相互に接近する方向へ折曲した第1規制部41が形成され、左右の傾斜突部40の後端部には第2規制部42が上方へ突出状に形成されている。左右の螺子駒15の角部の下面には傾斜溝43が形成され、雌螺子部28の後方において螺子駒15の後面には傾斜溝43の後端開口に連通する上下方向に延びる係合溝44が形成され、傾斜溝43の前端部は前方へ向けて開口されている。

【0020】左右の螺子駒15は、その傾斜溝43を操作部材16の左右の傾斜突部40に夫々嵌合させた状態で操作部材16上に組付けられ、操作部材16がロック位置に位置する状態では、図16に示すように、傾斜溝43の幅方向の略中央部に傾斜突部40が配置され、螺子駒15の前部の側方の係合面45に第1規制部41が当接するとともに、螺子駒15の係合溝44に第2規制部42が嵌合して、左右の螺子駒15の相互に離間する方向への移動が規制され、左右の雌螺子部28は突き合わされた状態に維持される。

【0021】一方、操作部材16を後方、つまりアンロック位置側へ操作すると、図17に示すように、傾斜突部40の傾斜押圧面46がそれに対面する傾斜溝43の傾斜受面47に当接するまで、左右の螺子駒15は相互に離間する方向へ移動しない状態が維持されて、第1規制部41が傾斜溝43内に入って係合面45から離脱するとともに第2規制部42が係合溝44から離脱する。そして、規制部41、42と螺子駒15との係合が解除された後、傾斜押圧面46が傾斜受面47に当接して、この状態で操作部材16を更に後方へ押し操作すると、図18、図19に示すように、傾斜受面47が傾斜押圧面46で押圧されて、第1付勢手段32の付勢力に抗して左右の螺子駒15が相互に離間することになる。

【0022】また、操作部材16から手指を放すと、第1付勢手段32により左右の螺子駒15が相互に接近する方向に移動するとともに、操作部材16が第2付勢手段33によりロック位置側へ移動し、左右の螺子駒15の雌螺子部28が螺軸5に螺合した状態で、第1規制部41が係合面45に当接するとともに、第2規制部42が係合溝44に係合して、左右の螺子駒15の相互に離間する方向への移動が規制されて、左右の螺子駒15で螺軸5が保持されることになる。

【0023】次に、高さ調整装置1の作用、効果について説明する。家具や家電機器等の高さを代える場合には、家具や家電機器等を支持した状態で、操作部材16を押し操作し、左右の螺子駒15を相互に離間させて、雌螺子部28を螺軸5から離脱させ、螺軸5の突出長さを所望の長さに調整する。そして、螺軸5を所望の位置に移動させてから操作部材16から手指を放し、左右の

螺子駒15の雌螺子部28を螺軸5に係合させるとともに、規制部41、42を左右の螺子駒15の夫々に係合させて、螺軸5の軸方向への移動を規制することになる。また、高さを微調整する場合には、脚座6を回転させて左右の螺子駒15に螺軸5を螺合させた状態を維持しながら螺軸5の突出長さを調整して、家具や家電機器等の高さを微調整することになる。

【0024】このように、操作部材16の押し操作によりワンタッチで、左右の螺子駒15と螺軸5との螺合関係を解除して、螺軸5を軸方向へ移動可能な状態にし、螺軸5に対する調整装置本体3の取付位置を変更することが可能となる。また、操作部材16から手指を放すことで、左右の螺子駒15が螺軸5に係合して螺軸5の移動が規制され、しかも左右の螺子駒15の離間方向への移動を雌螺子部28の前後両側に係合する2つの規制部41、42によりバランス良く受け止めて、左右の螺子駒15と螺軸5との係合関係が確実に維持されることになる。

【0025】尚、本発明に係るワンタッチ式アジャスターは、高さ調整装置1以外の機器に対しても適用することが可能である。

【0026】

【発明の効果】請求項1に係るワンタッチ式アジャスターによれば、螺軸に対する螺子駒の係合離脱を確実に行うことが可能となる。また、螺子駒と螺軸との係合面積を容易に大きく設定でき、螺子部分に対する負荷を小さくして、螺子部分の耐久性を向上できる。更に、螺子駒を螺軸に係合させた状態での、螺軸の回転操作性を向上して、螺軸に対する螺子駒の係合位置を容易に微調整することが可能となる。更にまた、規制部で螺子駒の離間方向への移動を規制するので、螺軸に対して軸方向に大きな力が作用しても確実に螺軸と螺子駒との係合関係を維持することが可能となる。

【0027】請求項2記載のように構成すると、螺子駒に対して作用する荷重を2つの規制部によりバランス良く受け止めることが可能となり、螺軸と螺子駒との係合関係を安定化させ、不用意に螺軸と螺子駒との係合関係が解除されるという不具合を防止できる。請求項3記載のように構成すると、螺軸と螺子駒との係合面積を極力大きくして、螺子部分に対する負荷を一層小さくでき、螺子部分の耐久性を向上できる。請求項4記載のように構成すると、ケーシングを家具や家電機器等の下部に組付けて、ワンタッチ式アジャスターをそのまま家具や家電機器等の脚部として用いることが可能となる。

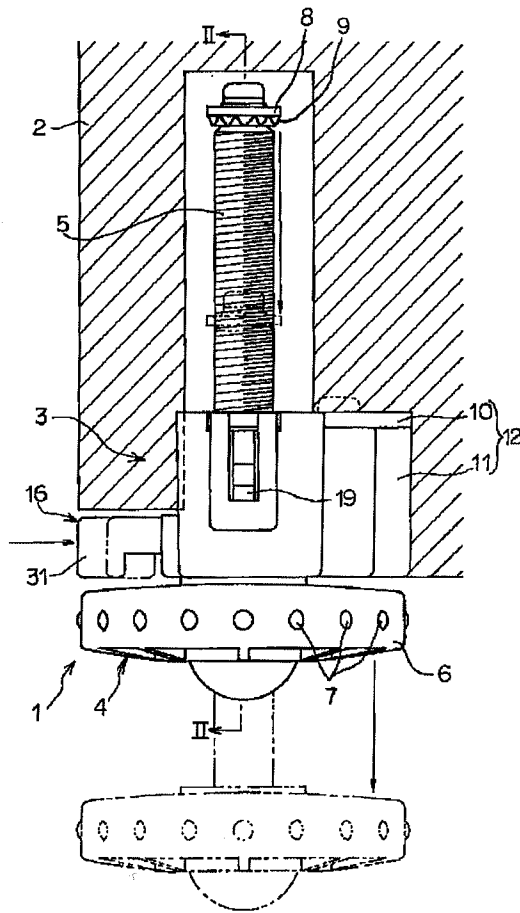
【図面の簡単な説明】

- 【図1】 高さ調整装置の側面図
 【図2】 図1のII-II線断面図
 【図3】 図2のIII-III線断面図
 【図4】 調整装置本体の分割斜視図
 【図5】 左右の螺子駒及び操作部材の斜視図
 【図6】 左側の螺子駒の平面図
 【図7】 同螺子駒の左側面図
 【図8】 同螺子駒の右側面図
 【図9】 同螺子駒の背面図
 【図10】 同螺子駒の底面図
 【図11】 操作部材の平面図
 【図12】 図11のXII-XII線断面図
 【図13】 操作部材の底面図
 【図14】 操作部材の背面図
 【図15】 操作部材の正面図
 【図16】 螺子駒及び操作部材の作動説明図
 【図17】 螺子駒及び操作部材の作動説明図
 【図18】 螺子駒及び操作部材の作動説明図
 【図19】 螺軸との係合を解除した状態における図2相当図

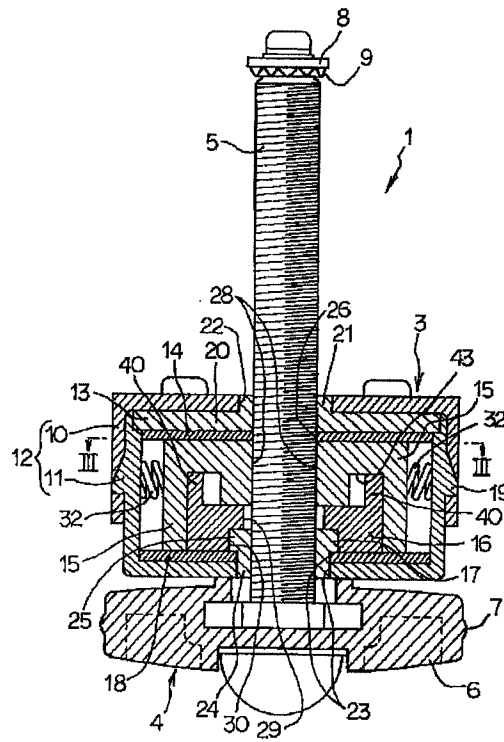
【符号の説明】

1	高さ調整装置	2	フレーム
3	調整装置本体	4	脚部
5	螺軸	6	脚座
7	突起	8	ストッパープレート
9	弾性部材		
10	上部ケーシング	11	下部ケーシング
12	ケーシング	13	上部スリーブ
14	上部プレート	15	螺子駒
16	操作部材	17	下部スリーブ
18	下部プレート	19	爪部
20	プレート部	21	筒部
22	取付孔	23	取付孔
24	筒部	25	鍔部
26	貫通孔		
28	雌螺子部	29	長孔
30	縦壁面	31	操作部
32	第1付勢手段	33	第2付勢手段
34	バネ保持溝	35	バネ保持部
40	傾斜突部	41	第1規制部
42	第2規制部	43	傾斜溝
44	係合溝	45	係合面
46	傾斜押圧面	47	傾斜受面

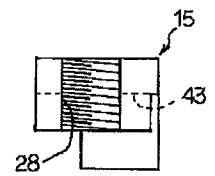
【図1】



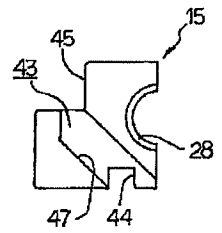
【図2】



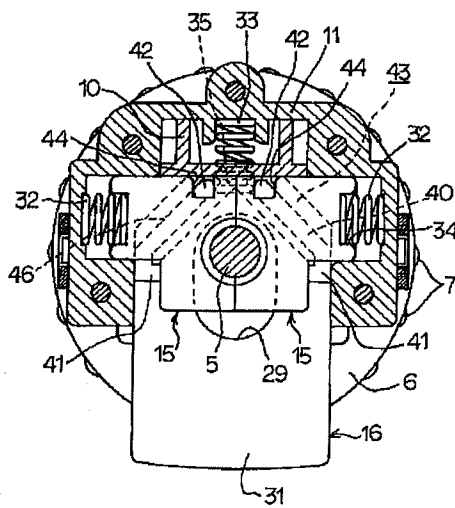
【図8】



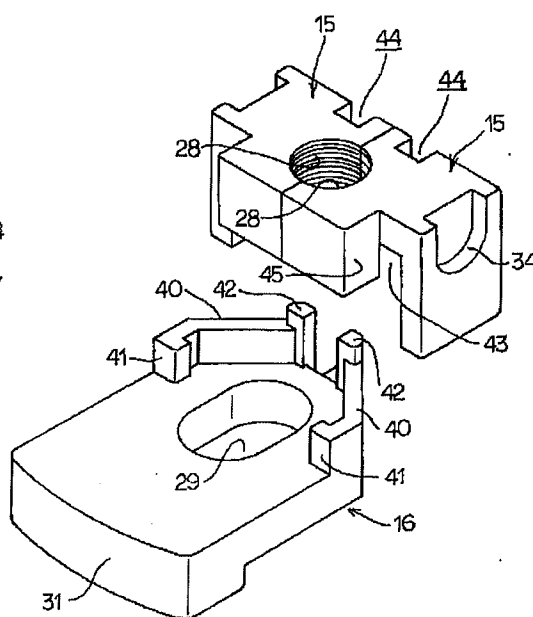
【図10】



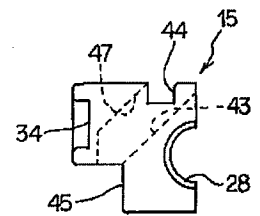
【図3】



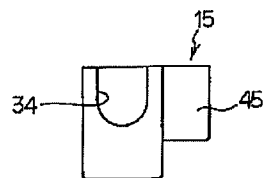
【図5】



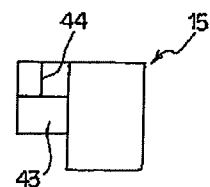
【図6】



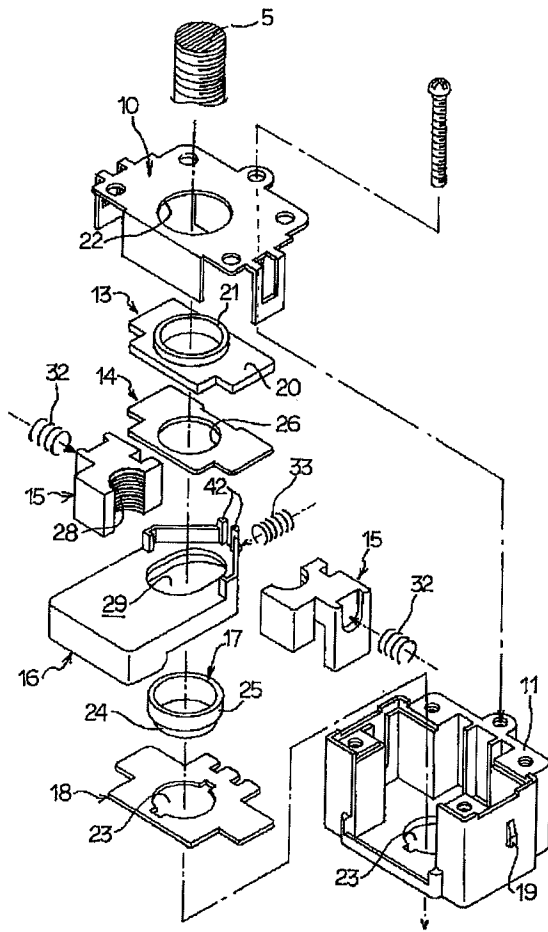
【図7】



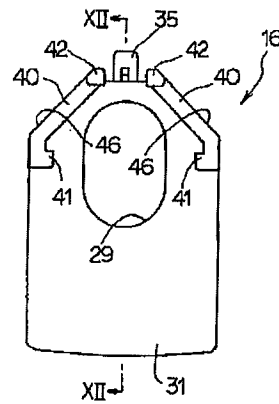
【図9】



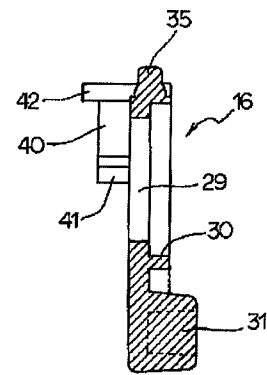
【図4】



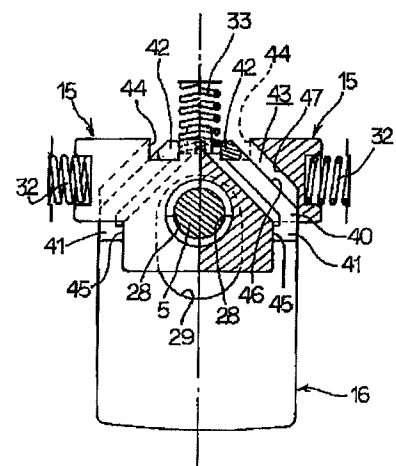
【図11】



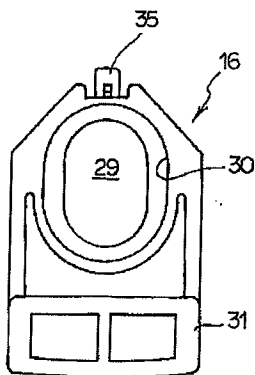
【図12】



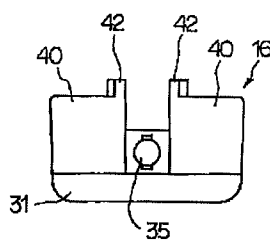
【図16】



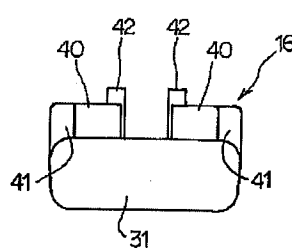
【図13】



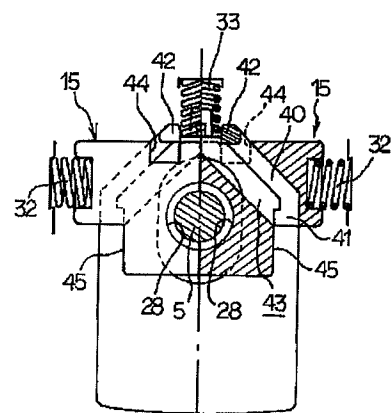
【図14】



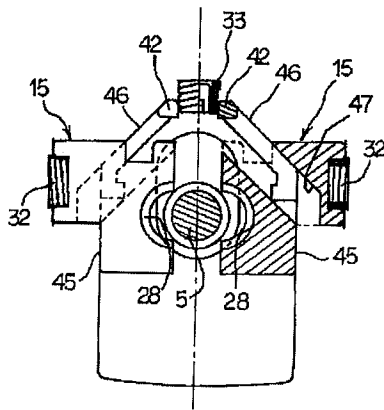
【図15】



【図17】



【図18】



【図19】

